

Final Exam Review Answer Key:

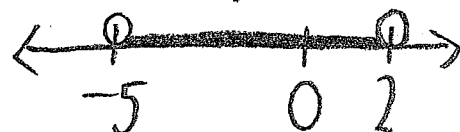
A. Chapter 6:

① $\{-4, 7\}$ ② $\left\{\frac{2 \pm \sqrt{10}}{3}\right\}$ ③ $\{2 \pm 3i\}$ ④ $\left\{-2, \frac{1}{4}\right\}$

⑤ 2 imaginary ⑥ 2 real, irrational ⑦ 2 real, rational

⑧ $K > \frac{25}{4}$ ⑨ $x^2 - 6x + 10 = 0$ ⑩ $x^2 + x - 12 = 0$

⑪ $x^3 + 3x^2 + 4x + 12 = 0$ ⑫ $\{-5 < x < 2\}$



B. Chapter 7:

① $P(3) = 56$ ② $x^4 + 2x^3 + 12x^2 + 24x + 48 + \frac{98}{x-2}$

③ $\{2, -1 \pm i\sqrt{3}\}$ ④ $\{2, -2, i\sqrt{6}, -i\sqrt{6}\}$

⑤ $\{9, -3 \pm 2\sqrt{2}\}$ ⑥ $x \approx -3.63$ (other 2 roots are imaginary)

⑦ $f^{-1}(x) = \frac{x+4}{3}$

⑧ a) as $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$
as $x \rightarrow +\infty$, $f(x) \rightarrow +\infty$

b) odd degree

c) 5 real zeros

d) positive leading coeff.

C. Chapter 8

$$\textcircled{1} (x+3)^2 + (y-4)^2 = 25 \quad \textcircled{2} (x-3)^2 + (y-2)^2 = \frac{4}{9}$$

$$\textcircled{3} (x-1)^2 + y^2 = 20 \quad \textcircled{4} \text{vertical} \quad \textcircled{5} \text{horizontal}$$

$$\textcircled{6} \text{vertical} \quad \textcircled{7} V(-2, -7) F(-2, -6.75) \text{ a.o.s. } x = -2 \\ D: y = -7.25$$

$$\textcircled{8} V\left(\frac{3}{2}, \frac{11}{4}\right) F\left(\frac{3}{2}, 3\right) \text{ a.o.s. } x = \frac{3}{2} \quad D: y = 2.5$$

$$\textcircled{9} V(-3, 0) F(-2.75, 0) \text{ a.o.s. } y = 0 \quad D: x = -3.25$$

$$\textcircled{10} C(0, 0) V(0, 7) V(0, -7) F(0, \sqrt{53}) F(0, -\sqrt{53}) m = \pm \frac{7}{2}$$

$$\textcircled{11} C(0, 0) V(4, 0) V(-4, 0) F(4\sqrt{2}, 0) F(-4\sqrt{2}, 0) m = \pm 1$$

$$\textcircled{12} C(0, 0) V(1, 0) V(-1, 0) F(\sqrt{5}, 0) F(-\sqrt{5}, 0) m = \pm \frac{1}{2}$$

$$\textcircled{13} \{(8, -6), (-6, 8)\} \quad \textcircled{14} x = -\frac{1}{8}(y+3)^2 + 2$$

$$\textcircled{15} \frac{(x-1)^2}{9} + \frac{(y-7)^2}{4} = 1 \quad \textcircled{16} \frac{x^2}{9} - \frac{y^2}{16} = 1$$

$$\textcircled{17} \frac{(x+1)^2}{4} + \frac{(y-3)^2}{1} = 1 \quad \underline{\text{ellipse}}$$

D. Chapter 10:

- ① $X = \frac{5}{2}$ ② $X = -\frac{1}{3}$ ③ $X = 4$
④ $X = \frac{7}{2}$ ⑤ $X = -3$ ⑥ $X = -2$
⑦ $T = 243$ ⑧ $X = 2$ ⑨ $b = \frac{1}{10}$
⑩ $2 \log X - \log 3 - \log Y$ ⑪ $X = 10$ ~~$X = 10$~~
⑫ $X = 2.4550$ ⑬ $X = 27.2991$ ⑭ $X = 0.5973$
⑮ \$35,816.95 ⑯ 14.2 years ⑰ \$60,635.50
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E. Chapter 11:

- ① 11, 15, 19 ② 14, 16, 18 ③ $A_4 = 26$
④ 10.25, 12.5, 14.75 ⑤ $A_7 = 5, 103$
⑥ $r = 3$ ⑦ 14, 28 ⑧ $S_5 = 40$ ⑨ $S_5 = 93$
⑩ \$72,000 ⑪ $S_\infty = \frac{9}{2} = 4.5$ ⑫ $S_\infty = 25$

